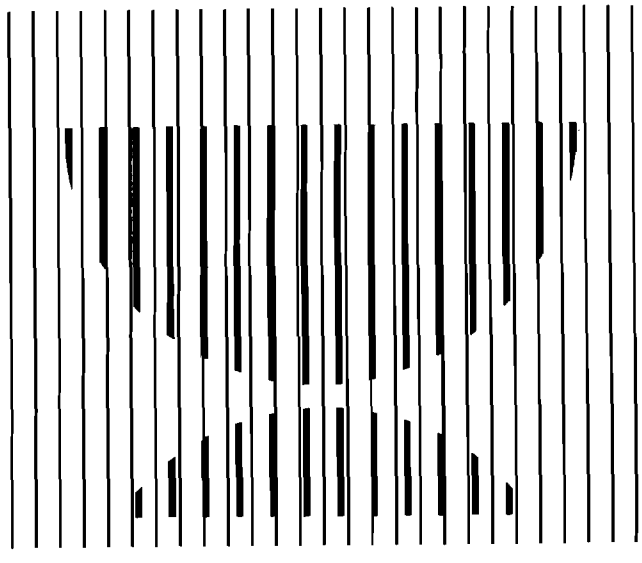
# CBO STAFF MEMORANDUM

## THE COSTS OF THE ADMINISTRATION'S PLAN FOR THE ARMY THROUGH THE YEAR 2010

December 1991



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This memorandum on costs of the Administration's plan for the Army was prepared by the Congressional Budget Office (CBO) in response to a request from the Chairman of the Committee on Armed Services of the House of Representatives. CBO prepared companion memorandums on budget requirements for the Navy and Air Force, and an overview paper that discusses requirements for the entire Department of Defense.

Frances M. Lussier of CBO's National Security Division wrote this memorandum under the general supervision of Robert F. Hale and R. William Thomas. Michael A. Miller, Raymond J. Hall, and William P. Myers of CBO's Budget Analysis Division provided detailed cost estimates. The author gratefully acknowledges the contributions of Lane Pierrot. Sherwood Kohn edited the manuscript and Judith Cromwell prepared it for publication.

## SUMMARY

The Army's budget rose rapidly during the 1980-1985 period, from $61 billion to $95 billion, and then fell almost as precipitously back to $75 billion for the 1991 fiscal year. (All costs in this memorandum are expressed in constant 1992 dollars of budget authority.) The Administration has submitted a detailed plan for Army spending through 1997. That plan calls for a further decrease in the Army's budget to $58 billion by the year 1997, commensurate with a proposed reduction in the number of military personnel and major combat units during the same period.

The Congressional Budget Office's (CBO's) analysis shows that in the years beyond 1997, in order to carry out currently planned modernization programs, the Army's budget must grow even without an increase in the size of the Army. The average annual increase could be as low as 2 percent or as high as 4 percent during the period from 1997 to 2003, depending upon assumptions about the costs of Army programs in the future. From 2003 until 2010, Army budget requirements will remain roughly constant or decrease. Thus, the average annual increase between 1997 and 2010 might be as low as 0.6 percent, using one set of assumptions, or as high as 1.1 percent, using another.

The need for budget increases is driven largely by two of the Army's planned modernization programs, the Armored Systems Modernization program and a program to produce a new reconnaissance-attack helicopter, formerly known as LHX and now renamed the RAH-66 Comanche. These two programs are scheduled to go into production in the late 1990s or the early part of the next decade. At their peaks, the programs could require annual funding of approximately $4 billion and $2 billion, respectively. Increases in program costs due to unanticipated cost growth could push the costs of these programs up even further.

These Congressional Budget Office estimates of the annual costs of the Army's long-term plans are based, wherever possible, on Department of Defense (DoD) and Army statements. For example, the estimates assume that the Army remains at its planned size for 1995 through 2010, an assumption consistent with statements by the Chairman of the Joint Chiefs of Staff. The estimates also assume that future forces are modernized with weapons planned for purchase by the Administration.

The range of estimated average annual increases in the costs of the Army's plan--from 2 percent to 4 percent a year between 1997 and 2003--primarily reflects different assumptions about the cost of weapons that the Army plans to purchase in the future. The lower estimate is based on the assumption that policies are adopted to hold down these costs, and that as a result the unit cost of weapons remains at levels currently estimated by the

Army, even though some of the weapons have yet to be designed. The lower estimate is also based on the assumption that costs for research, development, test, and evaluation; military construction; family housing; and all nonmajor procurement will return to historical average levels, adjusted for the smaller size of the Army. Under these assumptions, the costs of the Administration's current plans for the Army would rise from $58 billion in 1997 to $64 billion in 2003--an average growth of about 2 percent a year--and then would decline to $62 billion by 2006 and remain at this level through 2010. Army budgets at these levels would be about $4 billion above those planned by the Administration for 1997 (see the Summary figure).

The higher estimate of costs reflects past experience with acquisition programs. Weapons that have not yet entered production are assumed to experience real cost growth of about 25 percent. Costs for weapons that have not yet entered full-scale development are assumed to grow 50 percent. The costs of nonmajor procurement programs--that is, those dealing with the purchase of all material except "big ticket" items--are assumed to rise and fall with those of major programs, and the costs of research and military construction are assumed to be directly related to the cost of other Army functions. The relationship of these portions of the Army budget were based on spending patterns for the 1974-1991 period. Based on these assumptions, the annual cost of the Army's plan would grow rapidly from the 1997 planned level of $58 billion to almost $72 billion by the year 2003, requiring average annual real increases of 4 percent. After the year 2003, funding requirements would remain at about $71 billion through 2005 and would then fall to about $66 billion by 2010. Such funding levels would significantly exceed the $58 billion planned for 1997.

## INTRODUCTION AND BACKGROUND

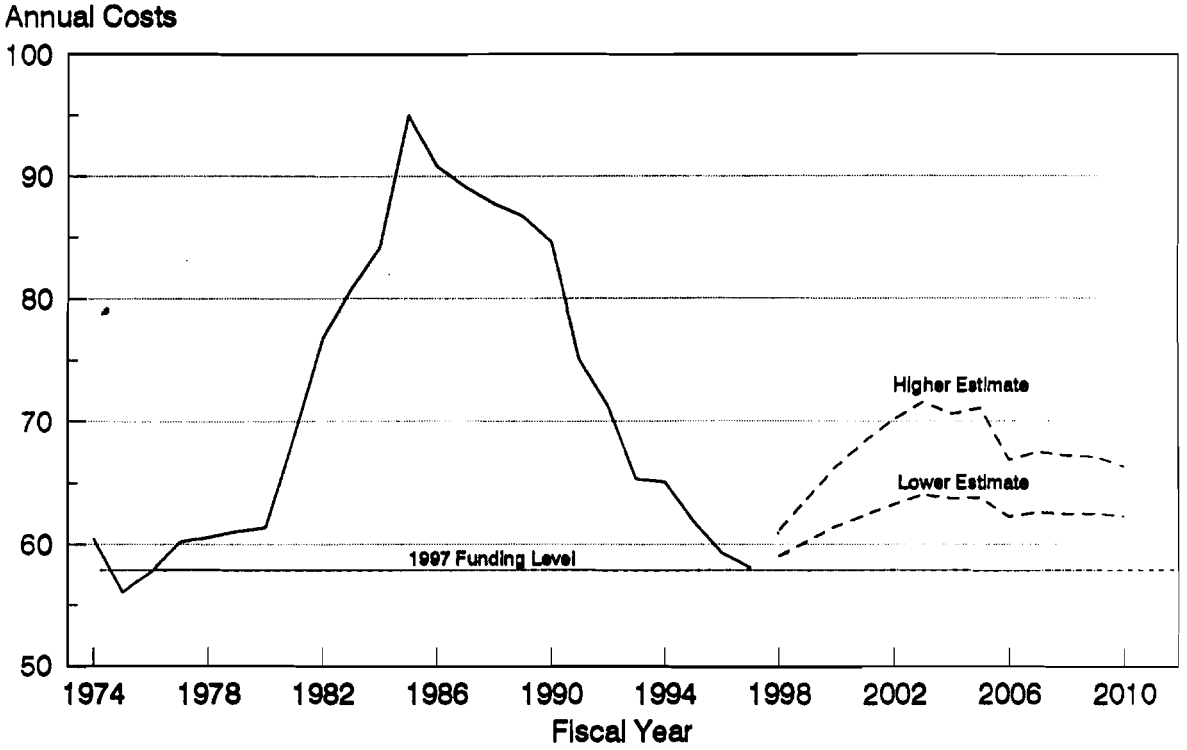
The Army is at a crossroads. It must adapt to a new world situation in which its primary enemy is no longer as formidable or as threatening as it has seemed to be for the past 40 years. The event for which the U.S. Army equipped and trained itself for decades--a surprise attack by the Warsaw Pact on Western Europe--is no longer possible. Furthermore, under the Administration's plan, both the size of the Army and the funds available to it will diminish in real terms, at least through 1997. The Army plans to reduce its number of active military personnel by about 30 percent by the end of fiscal year 1995 and to remain at that level through 1997.

But what happens beyond 1997? This staff memorandum describes CBO estimates of the costs of the Army's plans through the year 2010. This period is long enough to reflect the budgetary effects of the Army's programs

Summary Figure.

Total Army Costs: Past, Planned, and Future

(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Department of Defense data.

| | |
|---|---|
| Past or Planned Funding | ——— |
| Estimated Costs | - - - - - - - - |

to develop and buy new weapons, but not so long that details about the nature of these weapons do not exist. Included are estimates of what could happen to the Army's budget through 2010 if plans that the Administration has announced publicly are executed. Detailed fiscal plans are available for the years through 1997, the last year in the Future Years Defense Program submitted in February 1991. Detailed plans for forces are available publicly only through 1995. This memorandum assumes that the Army remains constant in size through the year 2010 at its planned 1995 level. This assumption is consistent with a statement by General Colin Powell, Chairman of the Joint Chiefs of Staff, that the military forces planned for 1995 represent the "minimum force structure for [America's] enduring needs."[1]

CBO's analysis is based on the assumption that the Administration carries out its announced plans to equip these forces with a variety of new and more capable weapons, including a new tank and helicopter. For categories of spending for which the Administration has not announced detailed plans, the analysis is based on assumptions that rely on historical precedents.

CBO's analysis of how Army costs are expected to change during the next six years is based on detailed plans submitted by the Administration to the Congress, and for the four years following on two sets of assumptions designed to capture the likely range of costs that the Army would incur in each of its major budget appropriations.

## MILITARY PERSONNEL

The appropriation for military personnel (MILPER) contains funds for the pay and allowances of all active-duty and reserve personnel, in addition to funds for travel and some other smaller categories. Army costs for military personnel are related primarily to the number of people in the service. By 1995, the Army plans to reduce the number of active-duty personnel from the 1990 level by more than one-quarter (see Table 1). The number of Guard and Reserve personnel will also shrink, by 27 percent and 23 percent, respectively. The Administration plans no further reductions in the numbers of active-duty and reserve personnel between 1995 and 1997.

Since the number of people on active and reserve duty will be reduced, so will the need for funds to pay them. Indeed, the Administration's planned budget for the military personnel appropriation reflects a substantial decrease--22 percent--in funds for all Army military personnel during the

1. Statement during hearings on the Base Force before the Subcommittee on Defense of the House Appropriations Committee, September 25, 1991.

TABLE 1. ARMY MILITARY PERSONNEL
(End strengths in thousands)

| Component | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Active | 751[a] | 702 | 660 | 618 | 577 | 535 | 535 | 535 |
| Guard | 437 | 457 | 411 | 366 | n.a. | 321 | 321 | 321 |
| Reserve | 299 | 319 | 283 | 255 | n.a. | 230 | 230 | 230 |

SOURCES: Congressional Budget Office based on Department of Defense data and Department of the Army, *Army Focus* (June 1991); presentation by the Chairman of the Joint Chiefs of Staff, General Colin Powell, to the Subcommittee on Defense of the House Appropriations Committee, September 25, 1991.

NOTE: n.a. = not available.

a. Includes 18,200 Guard and Reserve personnel activated for Operations Desert Shield and Desert Storm.

1990-1995 period (see Table 2). That military personnel budget would decline modestly between 1995 and 1997, resulting in a cumulative reduction of 28 percent between 1990 and 1997.

CBO assumes that costs for Army personnel would remain constant between 1997 and 2010 in real terms at the planned level for 1997 of $23 billion a year. This assumption is consistent with the premise that the size of the Army will remain constant during those years. Small changes in the composition of military personnel--for example, shifts in seniority or changes in number of personnel entering and leaving the military--would affect future spending in the military personnel appropriation. But these effects are not likely to be large or to alter the overall results in this analysis.

TABLE 2. ARMY FUNDING FOR MILITARY PERSONNEL
(In billions of 1992 dollars)

| Component | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Active | 27 | 25 | 24 | 23 | 22 | 20 | 19 | 19 |
| Guard | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| Reserve | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Total[a] | 32 | 31 | 30 | 28 | 26 | 25 | 23 | 23 |

SOURCE: Congressional Budget Office based on Department of Defense, *Future Years Defense Program* (February 1991).

a. Details may not add up to totals because of rounding.

## OPERATION AND MAINTENANCE

The Army's operation and maintenance (O&M) appropriation pays for most day-to-day operating costs except those for military pay. Funds in the O&M appropriation pay for the operation and maintenance of equipment, costs of utilities at bases, some costs of training, expenses for some spare parts, and repair of real property. The size of this appropriation depends somewhat on the number of weapons and supporting pieces of equipment that the Army operates and must maintain, which, in turn, is a function of the number of combat and support units within the service.

The number of Army combat and support units will decline in coming years. Between now and 1995, the Army plans to reduce the number of divisions and other major units in both its active and reserve components (see Table 3). Specifically, the active Army will shrink from five corps and 18 divisions to four corps and 12 divisions; the reserve component, which now includes 10 divisions, will retain six of these divisions in 1995. (An Army corps usually consists of two to five divisions, each of which contains between 10,000 and 17,000 personnel and associated equipment.) The Army will

TABLE 3. PROPOSED CHANGES IN ARMY FORCE STRUCTURE

| Type of Unit | 1990 | 1995 |
|---|---|---|
| Active | | |
| Corps | 5 | 4 |
| Divisions | 18 | 12 |
| Reserve Divisions | | |
| National Guard | 10 | 6 |
| Cadre | 0 | 2 |

SOURCE: Congressional Budget Office based on Department of the Army, *Army Focus* (June 1991).

partially offset these reductions by creating two new cadre divisions, maintained at a very low level of readiness. These divisions, part of the reserve component, will possibly be maintained at about 25 percent of the strength of an active-duty armored division and will require from 12 to 15 months to prepare for combat.

The Administration's proposed funding for the O&M appropriation reflects these reductions in forces. The total Army funding for O&M is scheduled to fall from $29 billion to $20 billion, or almost one-third, between 1990 and 1997 (see Table 4). (As with funds for military personnel, planned O&M budgets are publicly available through 1997, whereas numbers of units have been reported only through 1995.) O&M funding for the active Army will fall by 36 percent, an amount roughly proportional to the reduction in the number of active divisions. The Administration's proposed levels of O&M funding remain essentially constant for the reserve component even though it is slated to lose four of its 10 divisions.

These estimates of future O&M costs reflect efficiencies that the Department of Defense assumes will be achieved by implementing the Defense Management Review initiatives. For example, DoD expects to save $295 million in fiscal year 1992 by reducing travel costs and developing standard data-processing systems for the Army. DoD estimates that, through these and additional initiatives, it will reduce Army O&M costs in fiscal year 1992 by a total of $950 million.

TABLE 4. ARMY FUNDING FOR OPERATION AND MAINTENANCE
(In billions of 1992 dollars)

| Component | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Active | 27 | 23 | 22 | 19 | 18 | 18 | 17 | 17 |
| Guard | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Reserve | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Total[a] | 29 | 26 | 25 | 22 | 21 | 20 | 20 | 20 |

SOURCE: Congressional Budget Office based on Department of Defense, *Future Years Defense Program* (February 1991).

a. Details may not add up to totals because of rounding.

CBO estimates that Army O&M costs will remain roughly constant, at $20 billion per year, between 1997 and 2010. This is consistent with the assumption that the Army's forces will not change after 1995. Unlike costs associated with military personnel, however, it is more likely that O&M costs could deviate from this estimate, for several reasons. Some of the savings under the Defense Management Review may not be realized, which could increase funding requirements above those anticipated by the Administration.[2] Fielding of new weapons may also affect future O&M costs, although the direction of change is not clear. Most new weapons are designed to hold down operating and maintenance costs. In some cases, however, newer and more technically sophisticated weapons can raise these costs.

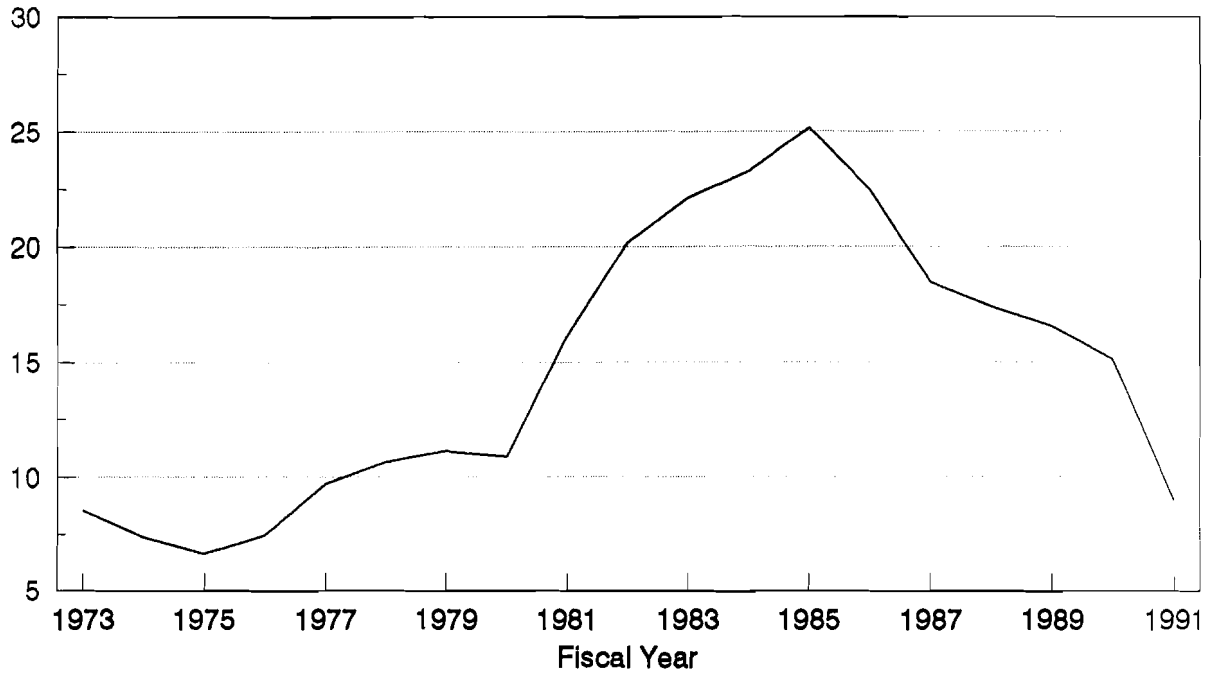
2. General Accounting Office, *DoD Budget; Observations on the Future Years Defense Program*, GAO/NSIAD-91-204 (April 25, 1991).

## PROCUREMENT

The Army's procurement appropriation includes funds to buy new weapons, funds for ammunition and support equipment such as radios, and funds for trucks, generators, and other equipment that support Army forces. The rate at which the Army spends money on equipment is not necessarily tied to the number of military units in the service. Indeed, between 1977 and 1985, when the size of the active Army remained relatively constant at 780,000 military personnel and 16 or 17 divisions, the real level of funds for procurement increased by a factor of two and one-half, from $10 billion to $25 billion (see Figure 1). This large increase in funds was not necessarily the result of a need for more equipment, but rather for more sophisticated and, hence, more expensive equipment. During that period, the Army bought a new generation of more sophisticated tanks, combat helicopters, and missiles designed to defeat more capable Soviet systems. Since 1985, Army funds to buy or modify equipment have been shrinking annually in real terms so that, in 1990, Army procurement totaled only $15 billion. As with the buildup from 1980 to 1985, this reduction in funds for procurement in the later 1980s was not tied closely to changes in the size of the Army.

The Army expects a continued decline in procurement funding through 1997. During the next several years, annual spending will range between $7 billion and $9 billion (see Table 5). The expected completion of several major modernization programs explains part of this sharp decline. Specifically, by the end of 1991, the Army will complete its purchase of Abrams tanks, Bradley fighting vehicles, and Apache helicopters. Newer weapons that will eventually replace these older systems are not expected to enter production before 1997, the last year for which detailed procurement plans are available.

Figure 1.
Army Procurement
(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Department of Defense data.

TABLE 5. ARMY FUNDING FOR PROCUREMENT
(In billions of 1992 dollars)

| Account | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Aircraft Procurement | 4.0 | 1.1 | 1.7 | 1.2 | 1.3 | 1.4 | 1.3 | 1.9 |
| Missile Procurement | 2.4 | 2.1 | 1.1 | 1.3 | 1.8 | 2.2 | 2.4 | 2.3 |
| Weapons and Tracked Combat Vehicles | 2.6 | 2.0 | 0.8 | 0.6 | 0.8 | 0.5 | 0.4 | 0.3 |
| Ammunition | 2.1 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 |
| Other Procurement | 3.9 | 2.5 | 3.2 | 3.1 | 4.1 | 3.5 | 3.1 | 2.4 |
| Total[a] | 15.1 | 9.0 | 8.0 | 7.4 | 9.2 | 8.7 | 8.3 | 7.9 |

SOURCE: Congressional Budget Office based on Department of Defense, *Future Years Defense Program* (February 1991).

a. Details may not add up to totals because of rounding.

## Estimated Costs of Major Programs

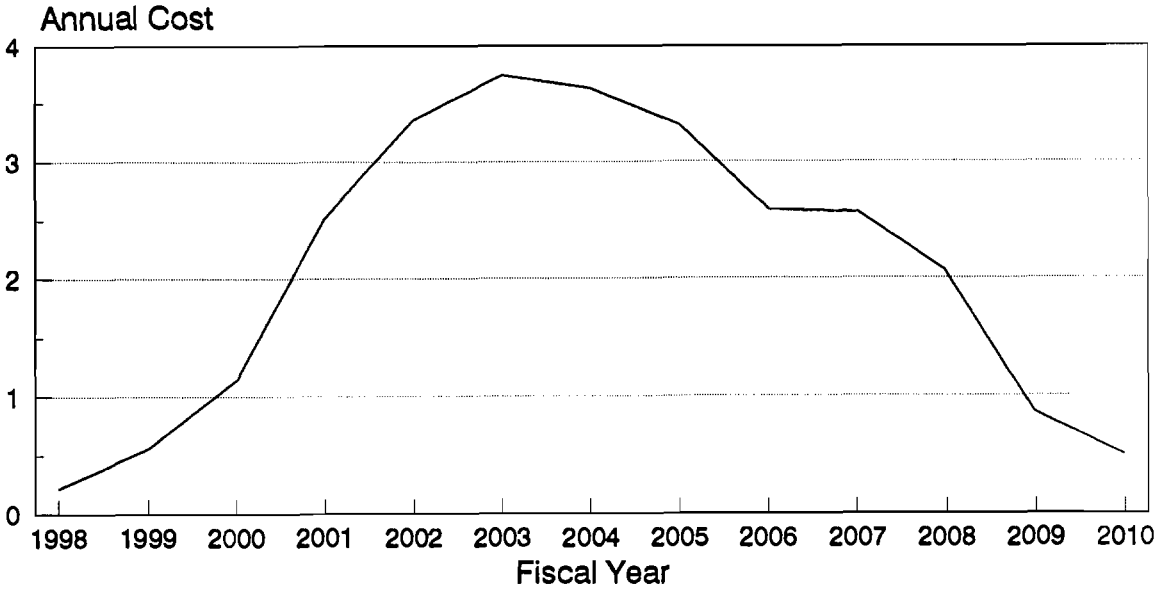
It would clearly not be reasonable to estimate procurement costs beyond 1997 based solely on the size of the Army. Some funding requirements, specifically those for major weapons, however, can be estimated on the basis of the Administration's stated plans, which include two major new weapons programs that will continue into the next century. One, the Armored Systems Modernization (ASM) program, will develop six new armored vehicles to replace or augment those in use today. Included in the ASM program are a new tank, a 155mm howitzer, and antitank, artillery support, fighting, and combat engineering vehicles. The other weapons program will develop and procure a new helicopter for reconnaissance and attack missions, the RAH-66 Comanche (formerly the LHX), that will replace several 1960s-vintage helicopters that are in use today.

Army plans for annual spending on these two programs through the year 2010 are not publicly available. However, some information is available about the total number of new weapons to be procured, total amount to be spent, and annual production rates. By combining the available pieces of data, CBO was able to estimate annual spending for the ASM and Comanche helicopter programs (see Figures 2 and 3). CBO's estimates are consistent with the Army's currently stated acquisition objectives. Some of the details underlying these estimates, including the average number of weapons that are expected to be purchased and the average unit costs of those weapons, are shown in Table 6.

If executed as currently planned, these two programs would represent a substantial investment by the Army. The ASM program alone could require almost $4 billion in 2003. When combined with the Comanche helicopter program, these two programs would require more than $5.6 billion in 2003, an amount that represents more than two-thirds of the Army's total procurement funding requested for 1992.

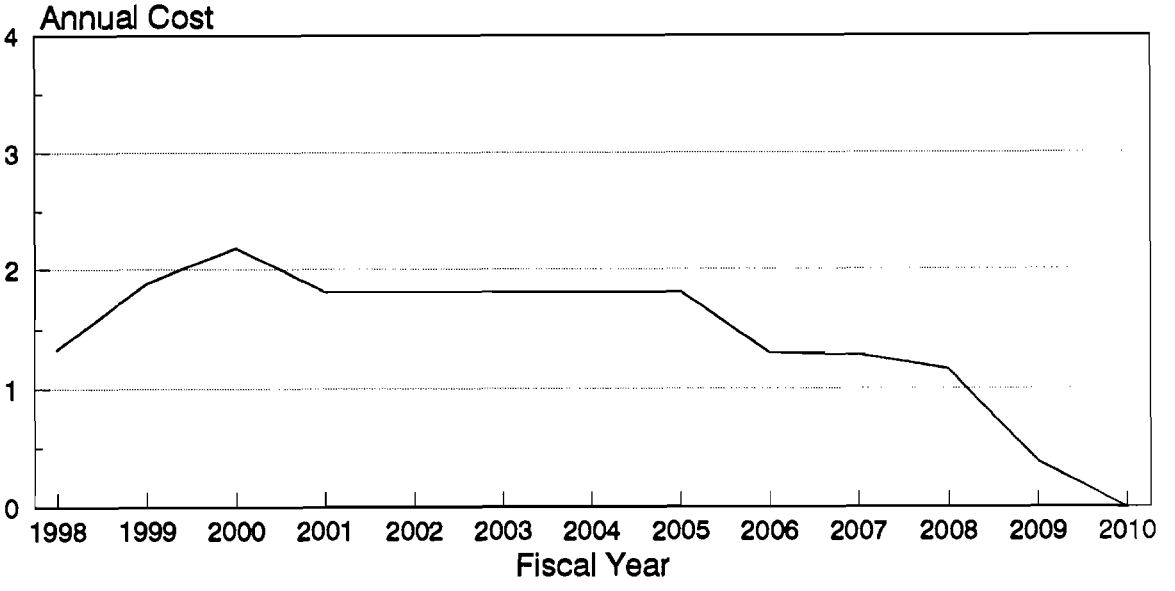
The Army has outlined needs for funds for several other major programs over the next two decades, although none is as large as either the ASM program or the helicopter program. These other programs include systems to defend Army divisions against enemy helicopters and other aircraft (the air defense antitank--ADATS--and Avenger systems and others), a new antitank weapon (known as AAWSM), and a new radar-guided missile for the Apache attack helicopter (called Longbow). Taken together, these smaller programs add nearly a billion dollars to the procurement costs that would be incurred in 2003.

Figure 2.
Estimated Procurement Costs of the Armored Systems Modernization Program
(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Army data.

Figure 3.
Estimated Procurement Costs of the Comanche Helicopter Program
(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Army data.

TABLE 6. ASSUMPTIONS ABOUT THE STRUCTURE OF THE ARMORED SYSTEMS MODERNIZATION AND COMANCHE HELICOPTER PROCUREMENT PROGRAMS

| Program | Years of Purchase | Maximum Annual Rate of Production | Average Unit Cost (Millions of 1992 dollars) | Total Quantity, 1998-2010 | Total Procurement Funds, 1998-2010 (Billions of 1992 dollars) |
|---|---|---|---|---|---|
| ASM | | | | | |
| Block III | 2000-2010 | 260 | 5.6 | 2,520[a] | 14.2 |
| AFAS | 2001-2009 | 100 | 4.6 | 824 | 3.8 |
| FARV-A | 2001-2009 | 100 | 0.8 | 824 | 0.7 |
| LOSAT[b] | 1998-2005 | 150 | 6.4 | 907 | 5.8 |
| FIFV | 2001-2012 | 200 | 3.3 | 1,750 | 5.4 |
| CMV[c] | 2001-2007 | 80 | 1.5 | 450 | 0.7 |
| Total | n.a. | n.a. | n.a. | 7,275 | 30.6 |
| Comanche Helicopter[d] | 1997-2010 | 120 | 14.8 | 1,464 | 20.1 |

SOURCES: Congressional Budget Office based on Department of the Army, *Army Aviation Modernization Plan 1991*, 1991; and briefings provided by the Department of the Army.

NOTES: Block III is the new tank; AFAS = advanced field artillery system; FARV-A = future armored resupply vehicle, ammunition; LOSAT = line-of-sight, antitank; FIFV = future infantry fighting vehicle; CMV = combat mobility vehicle; n.a. = not applicable.

a. Includes the purchase of 574 tanks above the Army's stated initial acquisition objective.

b. Includes funding for 58,000 kinetic energy missiles.

c. Annual procurement costs of the combat mobility vehicle would be funded by the appropriation for Other Procurement, Army and included in nonmajor procurement, as defined in this analysis.

d. Includes the cost of engines and purchase of 196 helicopters above the Army's stated initial acquisition objective.

Procurement of the initial quantities of Block III tanks and Comanche helicopters that the Army has indicated it intends to purchase would be completed by the years 2008 and 2009, respectively. Since terminating these programs when planned would replace less than half of the Army's tanks and would leave the helicopter fleet almost 400 aircraft short, CBO assumed that procurement of the two items would continue at full rate through 2010. More tanks and helicopters, beyond the number in the Army's initially stated objective, could cost the Army about $2.5 billion in 2010. In addition, the Army has said it needs a replacement for the current Hawk air defense system, which defends Army corps units against attack by enemy aircraft. Based on the cost of the Patriot system, the most recent long-range air defense weapon developed and purchased by the Army, CBO assumed that the replacement for the Hawk missile, referred to as Corpsam in Army documents, could cost about $1 billion a year during the second half of the next decade.

The cost of purchasing a new generation of armored vehicles, attack helicopters, and eight other systems could be $5 billion to $6 billion annually in the years between 2000 and 2009, if current Army projections turn out to be accurate (see Figure 4). They could, however, be pushed higher if costs for planned new systems exceed current estimates.

The ASM program, a composite of six separate programs, is just beginning. Designs for most of the vehicles do not yet exist. Past patterns suggest that the costs of these vehicles will be higher when they actually roll off the production line than the costs that the Army has projected. Therefore, when attempting to anticipate circumstances that could lead to higher costs for the Army's current procurement plans for the next 20 years, it is prudent to adjust estimates to reflect the potential for cost growth.

Significant cost growth has been common in defense weapons programs. Because the ASM program is far from production, CBO assumed an increase of 50 percent. Cost growth of 25 percent was assumed for programs that will enter production during the next six years.[3] These include the Comanche helicopter program, the Longbow program, the SADARM version of the MLRS rocket, the AAWSM missile, and the armored gun program. Because no costs or program schedule have been made available for the Corpsam

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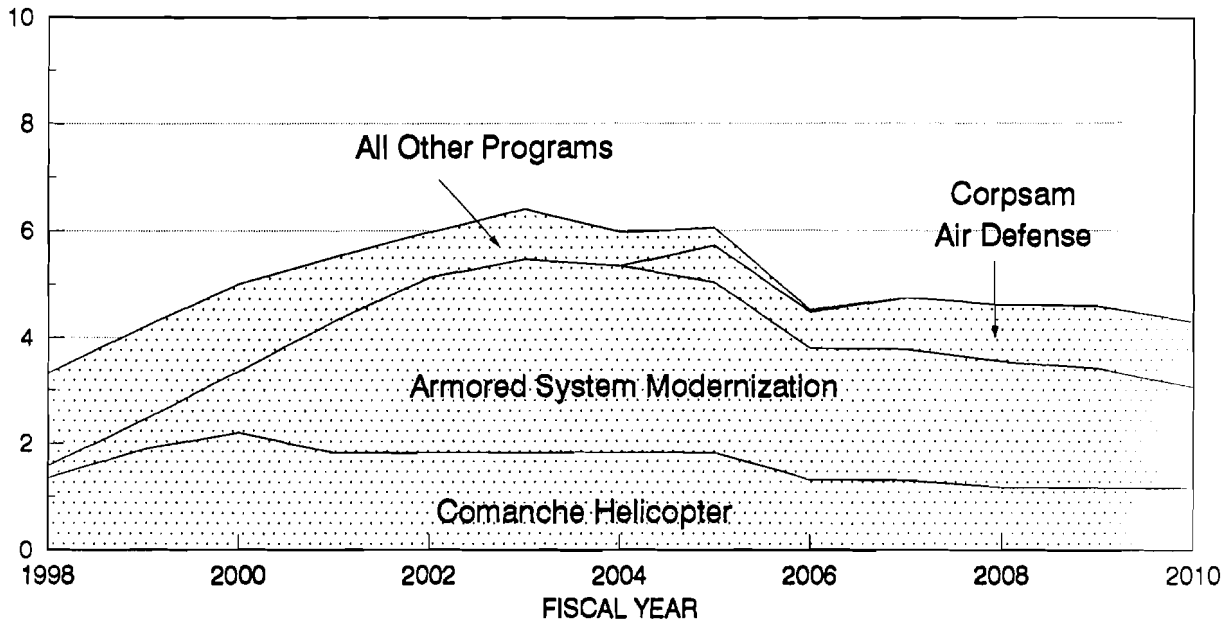
3. These rates of cost growth fall within the historical range. See Karen W. Tyson, J.R. Nelson, Neang I. Om, and Paul R. Palmer, "Cost and Schedule Growth in Major Acquisition Programs: An Empirical Analysis," *Proceedings of the 1989 Acquisition Research Symposium* (Washington, D.C.: Defense Systems Management College and the Washington, D.C., Chapter of the National Contract Management Association, 1989), p.125; and Gary Bliss, "The Accuracy of Weapons Systems Cost Estimates," presented at the 59th Military Operations Research Symposium, West Point, New York, June 12, 1991.

Figure 4.
Costs of Major Army Programs
(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Department of Defense data.

program, CBO used the Patriot system as a surrogate, and assumed for the high estimate that the new missile would cost 50 percent more than the 1960s-vintage Patriot.

Increasing unit costs could add between $1 billion and $2 billion each year to the costs of major programs. As a result, the total annual procurement cost of the major programs could reach more than $8 billion in the year 2002.

Estimating Total Procurement

Army procurement funds pay for many items other than the small number of major programs discussed above. For example, the President's budget for fiscal year 1992 listed 41 items in the aircraft procurement account alone. The other procurement account, which consisted of 195 line items in the fiscal year 1992 budget, includes funds to buy support equipment such as trucks and radios. Indeed, for fiscal year 1997, funding for major Army programs accounts for only $3 billion of the total $8 billion in procurement funds--or 38 percent--included in the Administration's plan for the Army. Clearly, any estimates of the costs of Army procurement through the year 2010 must take into account the need to provide funds for the hundreds of smaller, or nonmajor, programs. Unfortunately, CBO does not have detailed data to use in estimating the costs of these programs in the years beyond 1997. To allow for the uncertainty about future costs of nonmajor programs and the accuracy of current estimates of the costs of major weapons programs, CBO made two estimates of total procurement costs.

Lower Estimate. The lower estimate of procurement costs outlined in this memorandum is based, in part, on the assumption that costs for these nonmajor programs will return to their historical level, based on the average from 1974 to 1991, after taking into account the smaller size of the future Army. In addition, it is assumed that new weapons cost no more than currently estimated by the Army; that is, there is no unanticipated cost growth.[4] Thus, the lower estimate rests on the assumption that policies would be adopted to hold down the future cost of weapons by avoiding unplanned cost growth and by restricting spending for nonmajor programs.

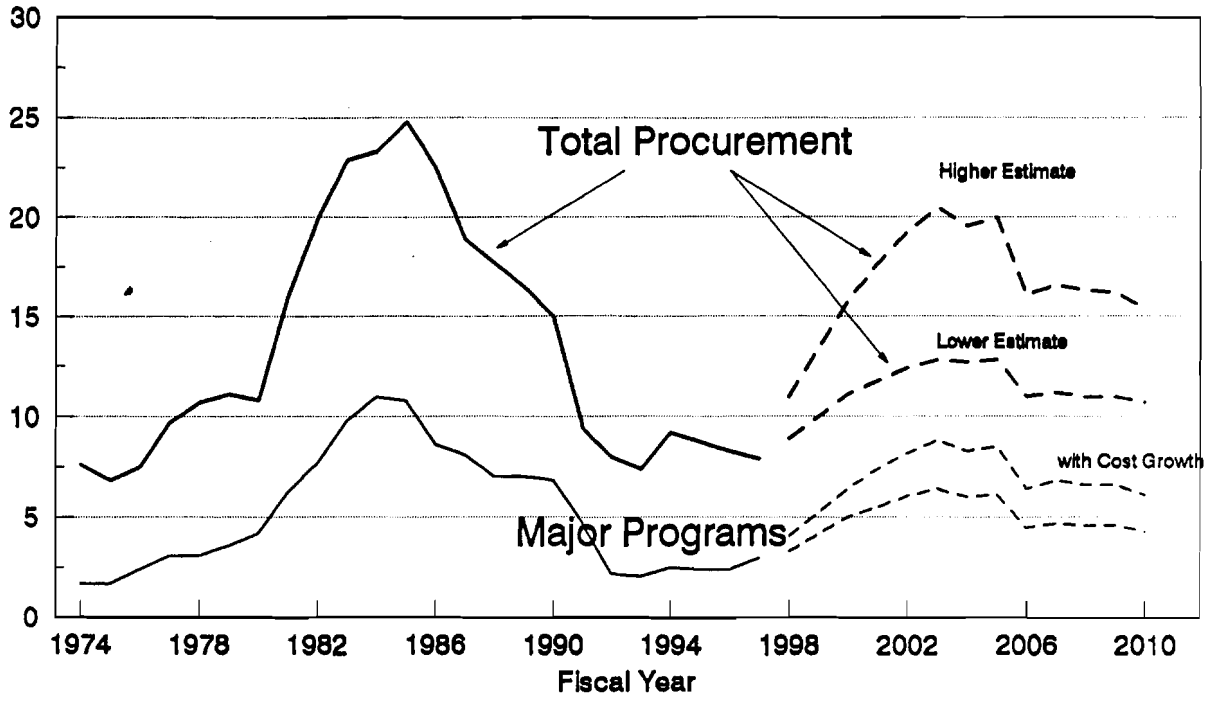
Procurement costs estimated with this method would rise from $8 billion in 1997 to more than $12 billion annually from 2003 to 2005, and then remain at around $11 billion a year through 2010 (see Figure 5). Annual procure-

4. Nonmajor procurement costs are assumed to grow from their 1997 level, which is below the historical average, to the average level by 2003. Nonmajor program costs are assumed to remain at the average level from 2003 to 2010.

Figure 5.

Army Procurement: Past, Planned, and Future

(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Department of Defense data.

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| Estimated Costs | ---------- |

ment costs, based on these estimates, would be less, in real terms, than the annual funding provided to the Army during the years from 1981 to 1990.

Higher Estimate. CBO's higher estimate of procurement costs is based on the assumption that the cost of nonmajor procurement is primarily related to the costs of procuring major weapons. In this way, as costs of the "big ticket" items rise, the costs of the numerous supporting items also increase. Such a relationship between costs of nonmajor and major procurement programs would be consistent with the way the Army has distributed its procurement funds in the past. There may also be a programmatic explanation for increases in the cost of nonmajor items as costs of major items rise; that is, the unit costs of new nonmajor systems that would support and complement the Army's new sophisticated weapons could rise sharply over the cost of the current generation of systems. This might be especially true of those missiles, radios, and radars that are considered to be nonmajor programs in this analysis. Furthermore, maintaining high levels of readiness in the Army might also result in increasing costs for ammunition, spare parts, material handling equipment, and trucks defined as nonmajor items in this analysis.

Whatever the reason, the costs of nonmajor procurement, and therefore total procurement, kept pace with the costs of major procurement during the past 18 years. Based on procurement data from the years 1974 through 1997, regression analysis shows that there is a statistically significant relationship between the costs of the Army's major programs and total procurement.[5] Using the linear relationship that results from the regression, CBO estimates that the cost of nonmajor procurement would rise from $5 billion in 1997 to $12 billion in 2005. These increases in costs may be necessary to maintain high levels of readiness for war, particularly if more sophisticated major weapons are to be maintained and tested. Indeed, the $5 billion figure for nonmajor items in the Administration's plan for 1997 represents the lowest estimate of spending in that category for all but one year between 1974 and 1997.

In addition to increased costs of nonmajor programs, the higher estimate is also based on the assumption that the cost of major programs will grow. When combined with the higher estimate of the cost of nonmajor programs, based on the regression analysis, total Army procurement costs would increase to over $19 billion in 2002 (see Figure 5), remain at about this level through 2005, and then fall to about $16 billion through 2009 and to $15

5. Specifically, CBO's analysis shows that cost of nonmajor programs in a given year equals 0.9 x cost of major programs + 0.1 x cost of nonmajor programs in the previous year + $3 billion. Including the costs of nonmajor programs from the previous year insures a smooth pattern of procurement costs from one year to the next.

billion in 2010. At these levels, Army procurement costs would approach those experienced during the middle of the 1980s.

## RESEARCH, DEVELOPMENT, TEST, AND EVALUATION; MILITARY CONSTRUCTION; AND FAMILY HOUSING

Through 1997, the Administration's plan would provide roughly constant funding for the three remaining Army appropriations--research, development, test and evaluation (RDT&E); military construction (MILCON); and family housing (see Table 7). Of these three, RDT&E represents the largest cost and involves the most uncertainty. For the years beyond 1997, for which the Army has not published any specific plans, CBO projected costs for RDT&E on the basis of two different methods. One estimate assumes that costs would return to average historical levels based on the average funding from 1974 through 1991.[6] Thus, by the year 2003, RDT&E costs would increase to slightly more than $5 billion annually, and would remain at that level through the year 2010.

Another method of estimating costs in this area is based on RDT&E's historical share of the Army budget. Between 1974 and 1991, funds for RDT&E averaged 7 percent of the total Army budget. If costs for RDT&E are estimated beyond 1997, based on maintaining a constant share of the total Army costs, then they will rise and fall as do costs for O&M, MILPER, procurement, MILCON, and family housing combined. Specifically, assuming that the costs of major programs grow as described above and that costs for nonmajor procurement increase with those for major procurement, then costs for RDT&E would increase from $4 billion in 1997 to almost $5 billion in 2001 and remain at approximately this level through 2010.

6. As with costs for nonmajor procurement, costs for RDT&E are assumed to rise from their planned 1997 level to the historical average in 2003 and remain level through 2010.

TABLE 7. ARMY FUNDING FOR RDT&E, MILCON, AND FAMILY HOUSING (In billions of 1992 dollars)

| Appropriation | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| RDT&E | 6 | 6 | 6 | 6 | 6 | 5 | 4 | 4 |
| MILCON | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| Family Housing | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |

SOURCE: Congressional Budget Office based on Department of Defense data.

NOTE: RDT&E = research, development, test, and evaluation; MILCON = military construction.

Only one estimate was made of future costs for family housing and military construction. Costs of family housing are assumed to be related to the number of active-duty personnel and so would remain constant at $1.4 billion through 2010 at the 1997 level planned by the Administration. Costs for MILCON are assumed to return to their historical level, based on the average for 1974 through 1991, adjusted for reductions in the size of the Army. MILCON costs would increase from $1.4 billion in 1997 to $1.8 billion by the year 2010.

## THE TOTAL ARMY BUDGET

When the estimated costs for the various parts of the Army budget are added up, the total suggests trends in the total cost of the Army for 1997 through 2010 that would differ sharply from those for the 1990-1997 period.

### Trends from 1990 Through 1997

The Administration's plan calls for an average real decline of 5 percent a year in the size of the total Army budget between 1990 and 1997 (see Table 8). Over the seven years, the Army budget would decline by more than 30 percent in real terms. This decline largely reflects the reductions in Army

personnel and force structure that are expected to take place during this period. The disproportionately large decline in procurement spending--more than 46 percent--is explained by the completion of several major programs, such as the Abrams tank and the Apache helicopter in 1990, and the absence of large new programs that enter production before 1997.

TABLE 8. TOTAL ARMY FUNDING, BASED ON THE ADMINISTRATION'S PLAN (In billions of 1992 dollars)

| Appropriation | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| MILPER | 32 | 31 | 30 | 28 | 26 | 25 | 23 | 23 |
| O&M | 29 | 26 | 25 | 22 | 21 | 20 | 20 | 20 |
| Procurement | 15 | 9 | 8 | 7 | 9 | 9 | 8 | 8 |
| RDT&E | 6 | 6 | 6 | 6 | 6 | 5 | 4 | 4 |
| MILCON | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| Family Housing | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| Total[a] | 85 | 75 | 71 | 65 | 65 | 62 | 59 | 58 |

SOURCE: Congressional Budget Office based on Department of Defense data.

NOTES: MILPER = military personnel; O&M = operation and maintenance; RDT&E = research, development, test, and evaluation; MILCON = military construction.

a. Details may not add up to totals because of rounding.

### Trends Beyond 1997

Beyond 1997, total Army costs seem likely to grow if the Administration carries out its apparent plan to hold forces constant at planned 1997 levels and to modernize them with new weapons now on the drawing boards. The amount of growth would, however, differ considerably under the lower and higher estimates in this memorandum.

Lower Estimate. Based on the assumption that the Army would adopt policies that avoid unplanned growth in the cost of major weapons and hold down other costs, CBO estimates that total annual costs to the Army through the year 2010 would exceed the planned level of real funding for 1997 by $4 billion at the peak in 2003 (see Figure 6). Although annual costs would rise to almost $64 billion by the year 2003, they would decline to $62 billion in 2006 and remain at that level through 2010.

Army budgets based on this lower estimate would reflect, to some extent, the substantial reduction in world tensions and the resulting reduction in the size of the Army. Even at its peak in 2003, the Army's budget, based on this lower estimate, would be smaller than any Army budget since 1980.

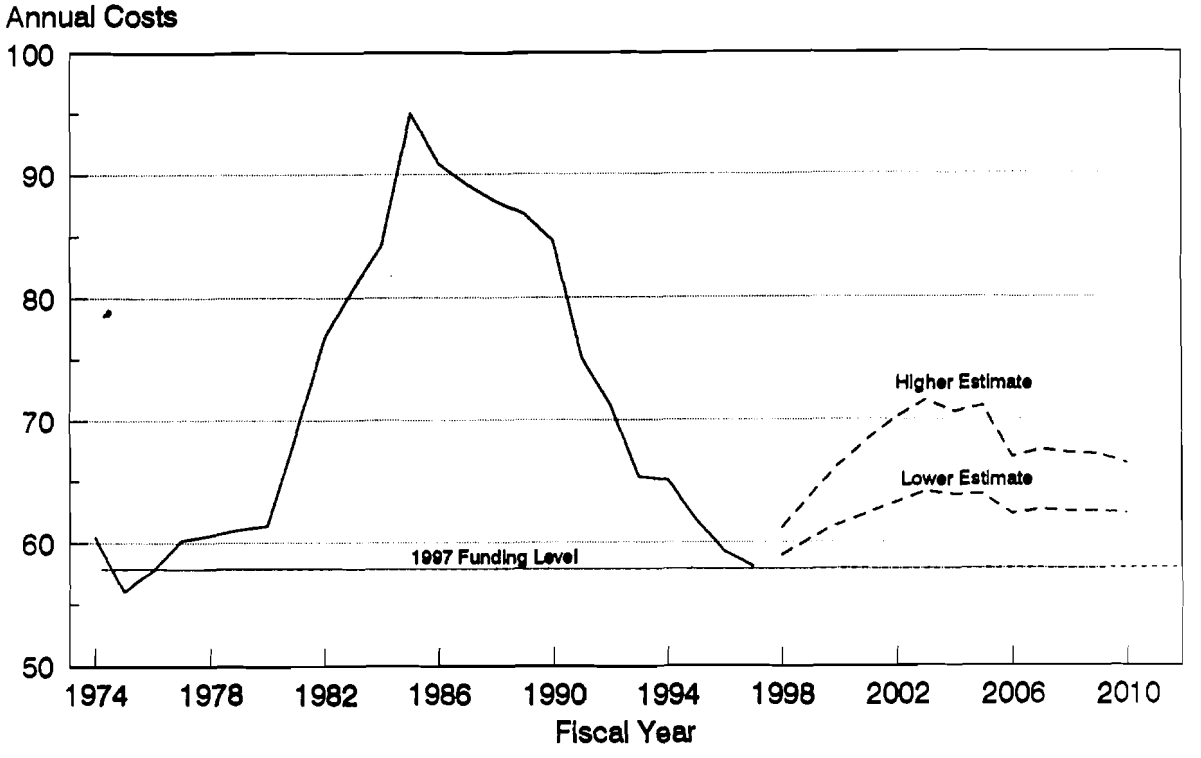
Higher Estimate. Costs reflected by the higher estimate discussed in this memorandum are more consistent with budgetary experience. They suggest a very different pattern of spending than does the lower estimate of the Administration's plan. Under the assumptions used to generate the higher estimate, Army costs would grow by an average of almost 4 percent annually from 1997 through 2003, to a level of $72 billion. This level of spending reflects hefty sums for procurement, primarily for the Army's ambitious ASM program and the Comanche helicopter. After 2003, costs would decline to about $66 billion in 2010. Thus, growth between 1997 and 2010 would average about 1.1 percent a year.

Compared with spending under the lower estimate, the Army costs as represented by the higher estimate would reflect a much smaller "peace dividend." Although Army budgets to meet these costs would remain well below the peak level of the 1980s, when the budget was about $95 billion, costs of $72 billion in 2003 would exceed any budget since 1992, which paid for an Army that was much larger than that projected for 2003.

## RESPONDING TO POTENTIAL BUDGETARY PRESSURES

This memorandum includes estimates of costs that are likely to be incurred by the Army under the Administration's plan. If costs for proposed weapons

Figure 6.
Total Army Costs: Past, Planned, and Future
(In billions of 1992 dollars)




SOURCE: Congressional Budget Office based on Department of Defense data.

| | |
|---|---|
| Past or Planned Funding | ——— |
| Estimated Costs | - - - - - - |

systems exceed current estimates, the Congress might respond by increasing the Army's budget. Fiscal limitations may, however, prevent any substantial increases, in which case the Congress will have to consider alternative policy responses to excessive demands on the Army's budget that seem likely under the Administration plan. These responses might include:

- Further reductions in the size of the Army, perhaps moving toward a "reconstitutable" Army that would be small in peacetime but would retain the capability to rebuild in the event that world tensions increased again;

- Delays in expensive modernization programs, particularly those that would replace existing sophisticated and capable systems like the M1 tank.

The latter approach may be particularly attractive in view of the recent vintage of many of the Army's major weapons. As an example, in 1995, after the planned reductions in numbers of Army units and after the transfer of weapons required by the treaty limiting conventional forces in Europe, CBO's analysis indicates that the average age of the Army's tank fleet--including all tanks in units and stored overseas--would be about eight years. Even if the Army delayed modernization of its tank fleet until the end of the next decade, the average age of the fleet would be about 23 years, and the oldest tanks in the fleet would be about 30 years old. Since the Army has retained tanks for 30 or more years in the past, a delay in the modernization program for tanks may be acceptable. Similar logic may suggest that delays in some other programs would also be acceptable. These delays would avoid the need for sharp increases in funding that would otherwise be required in the early part of the next decade.

Of course, delays in modernization must be considered in the context of potential threats as well as in a budgetary context. Such a discussion is beyond the scope of this memorandum, but it will be included in a forthcoming CBO study on the Army.